

### Abstract of the Disclosure

Particle analyzing systems with fluorescence detection are disclosed, primarily in connection with particle sizing based on scattered light intensity or time-of-flight measurement. In one system, emission of fluorescence is used as a threshold for selecting particles for further analysis, e.g. mass spectrometry. In another embodiment, laser beams arranged sequentially along an aerosol path are selectively switched on and off, to increase the useful life of components, and diminish the potential for interference among several signals. Other embodiments advantageously employ color discrimination in aerodynamic particle sizing, single detectors positioned to sense both scattered and emitted fluorescent radiation, and laser beam amplitude or gain control to enhance the range of fluorescence detection.

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